



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

REVIEWS.

Hussak's Geology of the Interior of Brazil. The Constitution of Brazil provides (Act 3) that: "An area of 14,400 square kilometers is reserved to the Union on the central plateau of the Republic, which shall be duly laid out, and in it the future federal capital shall be established." In 1892 a commission was appointed to locate, explore, and report upon the region referred to. Dr. Luiz Cruls, director of the astronomical observatory at Rio de Janeiro, was chief, and Dr. Eugene Hussak, geologist of the commission. A preliminary report has been published under the title, *Relatorio parcial da comissão exploradora do planalto central do Brazil*; Dr. Hussak's résumé of the geology of the region is given on pages 105-130.

In view of the little known of the origin of diamonds in Brazil, what he says on this subject is of special interest. Agua Suja is a diamond mine in the southwestern corner of the state of Minas Geraes, four leagues south of Bagagem, the place where the famous diamond, the "Estrella do Sul", was found.

In the region between Uberaba and Rio Paranahyba the streams have cut down through sandstone to the underlying highly inclined mica schists. These schists contain masses and veins of quartz rich in tourmalines. The horizontally bedded sandstone resting upon the schist is unfossiliferous, easily decomposed, somewhat argillaceous and probably of later age than Carboniferous. In some places eruptive rocks (augite porphyry) overlie the schists, and in others they are contemporaneous with or later than the sandstone. The country is covered almost everywhere with recent water-worn gravels, sometimes loose, sometimes cemented. In the newly opened diamond washings these gravels form horizontal beds more than thirty-five feet thick, and divisible lithologically into four groups. The lowest of these groups rests upon the sandstone, and contains the heavy materials, big water-worn boulders four to five decimeters in diameter, enclosed in fine

sand, and a great quantity of cobbles of augite porphyry, the size of one's fist at most. The big boulders are of muscovite granite rich in tourmaline, of augite porphyry, of mica schist, of soft yellow sandstone, etc. The diamonds are found only in the sand containing cobbles of augite porphyry. The diamonds thus far found are small, but they are all of the first water. The following minerals are found with the diamonds: rutile, magnetite, tourmaline, pyrope, a single ruby, and, most abundant of all, limonite. Magnetite is the most characteristic of these minerals.

In regard to the original matrix of the diamonds found at Agua Suja certain circumstances suggest that they have originated in a manner analogous to those of South Africa. Hitherto it has been thought that the diamonds of eastern Minas were derived from the mica schists. The African diamonds, on the other hand, are from rocks of eruptive origin. The following are Dr. Hussak's reasons for believing Agua Suja diamonds to have an origin similar to the African ones:

I. The absence or rarity of many of the minerals that accompany the diamonds found about Diamantina.

II. The presence of others, such as the pyrope garnets, that are characteristic of the African mines, which, in a certain sense, indicate the presence of eruptive rocks, but which are rare or altogether wanting in the Diamantina washings.

III. The abundance and character of the magnetite pebbles indicate a highly basic rock of eruptive origin, and related to the African peridotite.

On the other hand it is admitted that the abundant fragments of mica schists and granite show that these have furnished materials to the Agua Suja gravels, and in the absence of positive proof to the contrary it is admissible that either of them may have furnished the diamonds.

The remainder of Dr. Hussak's report contains an interesting sketch of the general geology of the high plateau of Brazil. The rocks of the region traversed—southwestern Minas and southeastern Goyaz—he divides into two groups: first, the crystalline schists which consist of mica schist and itacolumite. These are cut by eruptive granites and are auriferous. Second, sandstones and Palæozoic clay shales, the latter enclosing gray limestones.

Those portions of Minas and Goyaz traversed—part of the great central plateau of Brazil—form a typical plateau of transgression.

After the formation of the fundamental complex of schists, which here consists of metamorphosed marine sediments, there were orographic movements which lifted, folded, and metamorphosed them; these movements were probably accompanied by granitic eruptions producing granitic zones and pegmatite dikes.

The granitoid gneiss zone of the Paranahyba valley and Entre Rios and the amphibole schists probably represent later granitic and basic eruptions connected with and modified by orogenic movements.

After an interval of denudation came the sedimentary deposits which, upon elevation, form the region of schists, sandstones, and Palæozoic limestones between Santa Luzia and Formosa, and further to the north the lofty (1500 meters), flat-topped Veadeiros.

This second uplift closed the cycle of great geologic events for this region, and it has ever since been undergoing denudation. In the surrounding region, however, to the north and to the west in the Tocantins-Araguaya and the Xingú and Paraguay basins, to the east in the basin of the São Francisco, and to the south in that of the Paranan, enormous sedimentary deposits were laid down, which, by transgression, covered the margins of the old Goyaz island and extended over enormous areas in the basins mentioned. The later deposits have remained in a horizontal position. They seem to have begun in Devonian times and to have gone on with certain interruptions up to Mesozoic times. In the mining area about Uberaba the rocks are soft sandstones, and augite porphyries belonging to this great horizontal series. The sandstone is the continuation of the beds which in São Paulo overlie fossiliferous Carboniferous or Permian rocks; it is probably Triassic.

The characteristic feature of this formation in the Paranan basin is the abundance of eruptive rocks, suggesting a very active volcanic epoch. Denudation has deeply trenched the plateau, leaving a characteristic topography. Wherever erosion has cut down to the harder itacolumites these are left as high and rugged foothills with steep flanks. The limestone also resists erosion better than its associated rocks.

The last and newest formation of all these is the top dressing of gravel, which is not a marine deposit, however, but the result of atmospheric agents and the deposits of modern streams.

J. C. BRANNER.